

ECE 351 PreLab 10

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April 17 2023

Here are the required pre-lab calculations:

We are given:

$$H(s) = \frac{\frac{1}{RC}s}{s^2 + \frac{1}{RC}s + \frac{1}{LC}}$$

so we need to find the g value for this given function:

$$g = \frac{1}{RC}s \Big|_{-s=p}$$

$$p = -\frac{\frac{1}{RC}}{2} \pm \frac{\sqrt{\frac{1}{(RC)^2} - 4(\frac{1}{LC})}}{2}$$

$$g = \frac{1}{RC} \left(-\frac{\frac{1}{RC}}{2} \pm \frac{\sqrt{\frac{1}{(RC)^2} - 4(\frac{1}{LC})}}{2} \right)$$

$$|g| = \sqrt{\left(-\frac{1}{2(RC)^2} \right)^2 + \left(\frac{\sqrt{\frac{1}{(RC)^2} - 4(\frac{1}{LC})}}{2RC} \right)^2}$$

$$\angle g = \tan^{-1} \left(\frac{\frac{\sqrt{\frac{1}{(RC)^2} - 4(\frac{1}{LC})}}{2RC}}{\frac{1}{(RC)^2}} \right)$$